REMARKS/ARGUMENTS

Application Status

The status of the application is as follows:

- Claim 1 has been amended to include elements of cancelled claim 6. Claims 2, 7, and 8 have also been amended herein, and claims 11-19 have been newly added.
- The drawings are objected due under 37 C.F.R. §1.83(a).
- The specification is objected to for failing to capitalize a trademarked term.
- Claim 2 is objected to due to a minor informality.
- Claims 1-4, and 9 stand rejected under 35 U.S.C. §102(b) as being anticipated by van Eijk, *et al.* ("Nd^{3+} and Pr^{3+} Doped Inorganic Scintillators").
- Claim 5 stands rejected under 35 U.S.C. §103(a) as being unpatentable over van Eijk, *et al.* in view of Srivastava (US 5,273,681).
- Claim 6 stands rejected under 35 U.S.C. §103(a) as being unpatentable over van Eijk, *et al.* in view of Boerner, *et al.* (US Publication No. 2001/0006214).
- Claims 7 and 8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over van Eijk, *et al.* in view of Boerner, *et al.* and further in view of Tonami, *et al.* (US 5,909,029).

The objections and rejections are discussed in detail below.

The Objection to the Drawings

A replacement sheet is attached herewith and includes a color converter and light guide arrangement. Accordingly, withdrawal of this objection is respectfully requested.

The Objection to the Specification

The specification is objected to for failing to capitalize a trademarked term. This minor informality has been corrected herein, and withdrawal of this objection is respectfully requested.

The Objection to Claim 2

Claim 2 stands objected to due to a minor informality. This claim has been amended to cure the informality. Therefore, withdrawal of this objection is respectfully requested.

The Rejection of Claims 1-4, and 9 Under 35 U.S.C. §102(b)

Claims 1-4 and 9 stand rejected under 35 U.S.C. §102(b) as being anticipated by van Eijk, *et al.* Withdrawal of this rejection is respectfully requested for at least the following reasons. Claim 1 has been amended to include elements of cancelled claim 6. Additionally, neither van Eijk, *et al.* nor Boerner, *et al.* teaches elements arranged as set forth in claim 9. Accordingly, claim 1 (and claims that depend therefrom) are not obvious over van Eijk, *et al.* in view of Boerner, *et al.*

Claim 1

Claim 1, as amended, recites *a device for generating images and/or projections by means of an imaging method, which device includes a device for the detection of input radiation which includes at least one acquisition element which comprises a sensor with a Pr^{3+}-activated scintillator for converting the input radiation into UV radiation, a color converter which contains a luminous substance for converting the UV radiation to an optical signal, and a photodiode which converts an optical signal into an electrical signal.*

Van Eijk, *et al.* is directed to research regarding development of inorganic scintillators, and provides research results with respect to Nd and Pr-doped scintillators.[1] The Examiner concedes that Van Eijk, *et al.* fails to teach or suggest *a color converter which contains a luminous substance which can be excited by UV radiation is arranged between the sensor and the photodiode in the device for the detection of input radiation* as claimed, and cites Boerner, *et al.* to support this rejection.

[1] Van Eijk, page 664, Abstract

In contrast to the assertions set forth in the Office Action, Boerner, *et al.* is silent with respect to the aforementioned claimed aspects. Boerner, *et al.* discloses a color transformer containing a photoluminescent phosphor being arranged between a scintillator and an array of photodiodes.[2] Each of the scintillators disclosed in Boerner, *et al.* produce output radiation with emission maxima in the visible spectrum. Boerner, *et al.* also teaches that visible light of one color can be converted to visible light of another color – thus, for example, the color transformer of Boerner, *et al.* can transform blue light to red light.[3] The subject claim, however, requires *a color converter which contains a luminous substance which can be excited by UV radiation* (outside the visible spectrum).

Additionally, there is no motivation to combine the cited references in the manner described by the Examiner. More particularly, arranging the color transformer as taught by Boerner, *et al.* between a sensor that emits UV radiation and a photodiode would result in an inoperable or inefficient detector, as the color transformer of Boerner, *et al.* transforms light in the visible spectrum from one color to another color.

For at least the above reasons, withdrawal of the rejection and allowance of claim 1 as amended is respectfully requested.

Claim 2

Claim 2 has been amended to recite *wherein the Pr^{3+}-activated scintillator is chosen from the group $LaPO_4$:Pr, LuF_3:Pr, $LuCl_3$:Pr, $LuBr_3$:Pr, $(Lu_{2-x}Y_x)SiO_5$:Pr, where $0 \leq x \leq 1$, $(Lu_{1-x}Y_x)Si_2O_7$:Pr, where $0 \leq x \leq 1$, $(Lu_{1-x}Y_x)BO_3$:Pr, where $0 \leq x \leq 1$, and $Ca_{1-2y}Li_2SiO_4$:Pr_yNa_y, where $0.001 \leq y \leq 0.2$.* These scintillators are not disclosed in van Eijk, *et al.* or Boerner, *et al.* Accordingly, the rejection of this claim should be withdrawn.

Claims 3 and 4

These claims are believed to be allowable at least by virtue of their dependencies from claim 1.

[2] Boerner, *et al.*, Abstract
[3] Boerner, *et al.*, page 2, paragraph [0023]

Claim 9

Claim 9 recites *a device for the detection of input radiation which includes at least one acquisition element which comprises a sensor with a Pr^{3+}-activated scintillator for converting the input radiation into UV radiation and a photodiode which converts an optical signal into an electrical signal.*

As noted above, Van Eijk, *et al.* is directed to research regarding development of inorganic scintillators, and provides research results with respect to Nd and Pr-doped scintillators.[4] Van Eijk, *et al.* notes that different applications will have different requirements with respect to light yield, decay time, and emission wavelengths. For example, Van Eijk, *et al.* asserts that emission wavelengths are based on a need to match sensitivity curves of various light sensors, including silicon photodiodes.[5] The cited reference then explains that Ce^{3+} doped crystals emits radiation at longer wavelengths when compared with Pr^{3+}, which has the advantage of matching with the sensitivity curves of silicon diodes.[6] Van Eijk, *et al.* concludes by stating that Pr^{3+} scintillators could be of interest, even though high light yields had not been observed.[7]

Accordingly, van Eijk, *et al.* discloses preliminary research on Pr^{3+}-doped scintillators that could be of interest, but does not disclose Pr^{3+}-activated scintillators placed in a sensor and used together with a photodiode in a device for the detection of input radiation as required by this claim. In fact, van Eijk, *et al.* notes that silicon diodes are used with Ce^{3+} doped scintillators since emissions from such scintillators have wavelengths that match sensitivity curves of silicon diodes.

Therefore, since van Eijk, *et al.* does not disclose arrangement of a photodiode together with a Pr^{3+} activated scintillator, withdrawal of the rejection of this claim is respectfully requested.

[4] Van Eijk, page 664, Abstract
[5] Van Eijk, paragraph beginning on page 664 and continuing to page 665
[6] Van Eijk, paragraph beginning on page 665 and continuing to page 666
[7] Van Eijk, page 667, Conclusions

The Rejection of Claim 5 Under 35 U.S.C. §103(a)

Claim 5 stands rejected under 35 U.S.C. §103(a) as being unpatentable over van Eijk, *et al.* in view of Srivastava. This rejection should be withdrawn, as claim 5 is believed to be allowable at least by virtue of its dependency from claim 1.

The Rejection of Claim 6 Under 35 U.S.C. §103(a)

Claim 6 stands rejected under 35 U.S.C. §103(a) as being unpatentable over van Eijk, *et al.* in view of Boerner, *et al.* The limitations of claim 6 have been incorporated into independent claim 1, and accordingly this rejection should be withdrawn.

The Rejection of Claims 7 and 8 Under 35 U.S.C. §103(a)

Claims 7 and 8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over van Eijk, *et al.* in view of Boerner, *et al.* and further in view of Tonami, *et al.* This rejection should be withdrawn, as the Examiner has failed to establish a *prima facie* case of obviousness with respect to these claims.

Claim 7

Claim 7 depends from amended claim 1 and recites *wherein the color converter comprises a polymer light guide which is doped with the luminous substance that can be excited by UV radiation.*

Tonami, *et al.* teaches use of an optical fiber plate inserted between a scintillator and a photodiode, wherein the optical fiber plate includes a plurality of optical fibers bonded together and arranged in a particular direction.[8] Such direction is chosen to aid in the capture of incident light directed towards a scintillator.

Tonami, *et al.* makes no mention of using a polymer light guide in a color converter as required by this claim, much less a polymer light guide doped with a luminous substance that can be excited by UV radiation as required by claim 7. Instead, as noted above, Tonami, *et al.* teaches use of optical fibers to preclude dispersion of

[8] Tonami, *et al.*, column 3, lines 25-31

incident light in the direction of a surface. The Examiner asserts that the incorporation of a color-transforming component suggested by Boerner, *et al.* as a dopant would be obvious since wavelength shifting dopants are known. However, the color-transforming component of Boerner, *et al.* transforms a color in the visible spectrum to another color in the visible spectrum, and does not disclose receipt of UV radiation. Accordingly, even if Boerner, *et al.* were combinable with Tonami, *et al.,* such combination would fail to teach the invention as recited in claim 7.

Claim 8

Claim 8 depends from claim 1 and recites *wherein the color converter comprises a polymer light guide and a separate layer with the luminous substance that can be excited by UV radiation.* Tonami, *et al.* makes no mention of a separate layer with the luminous substance that can be excited by UV radiation as required by this claim. Instead, Tonami, *et al.* teaches use of optical fibers to preclude dispersion of incident light in the direction of a surface. The Examiner asserts that the incorporation of a color-transforming component suggested by Boerner, *et al.* as a separate layer would be obvious since polymer fiber optics are known in the art. However, the color-transforming component of Boerner, *et al.* transforms a color in the visible spectrum to another color in the visible spectrum, and does not disclose receipt of UV radiation. Accordingly, even if Boerner, *et al.* were combinable with Tonami, *et al.,* such combination would fail to teach the invention as recited in claims 7 and 8.

New Claims

Claims 11-20 have been newly added, and are believed to be allowable at least in view of the comments above and/or their dependencies from their respective base claims.

Conclusion

In view of the foregoing, it is submitted that claims 1-20 distinguish patentably and non-obviously over the prior art of record. An early indication of allowability is earnestly solicited.

Respectfully submitted,
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